

Remarks

This Amendment is responsive to the Office Action dated 5/17/05. In the Office Action claims 3-17 were objected to under § 112 for the use of terms in the preamble third harmonic, fourth harmonic and fifth harmonic lasers. The Examiner objected to the use of the term "output coupler" in claims 3, 11, 16 and 17 as lacking antecedent basis.

Applicant has amended the claims to make them more definite. The Section § 112 objection to the term "output coupler" in claims 3, 11 and 16 through 17 has been met as suggested by the Examiner. The terms third, fourth and fifth harmonic have been deleted from the preamble.

In addition, in the Office Action, claims 1 and 2 were rejected under 35 U.S.C. § 102(b) as anticipated by US Patent No. 5,943,351 (Zhou). Reconsideration of the rejection under 35 U.S.C. § 102(b) is respectfully requested.

Applicant's invention relates to a laser for producing 3rd, 4th or 5th harmonic beam. The resonator is formed between a first and second reflector. The resonator includes the laser medium for producing a fundamental beam. A second harmonic generator is located within the resonator for generating a second harmonic beam from the fundamental beam produced in the resonator. The resonator produces two (2) resonator output beams of preselected different wavelengths at least one of which is a harmonic beam. One or more output couplers are provided to remove at least a portion of the two output beams from the resonator and direct the removed beams on preselected paths outside the resonator.

The 3rd, 4th or 5th harmonic non-linear crystal is located outside the resonator cavity and located along the preselected optical paths of both output beams to produce a 3rd, 4th or 5th harmonic beam from the two output beams. Reconsideration of the rejection is requested. Applicant's invention provides an efficient method to generate higher order harmonic beams outside the fundamental and second harmonic resonator cavity.

The Zhou '351 patent does not show or suggest Applicant's invention. In the Office Action, it is stated that the '351 patent in Fig. 7 discloses a first reflector 10 and a second reflector 64 forming a resonator cavity having an optical axis said resonator including a laser medium 20 for producing a fundamental beam. The Office Action goes on further to state that the first reflector is highly reflective for fundamental beam and that a second harmonic generator 30 is located within the resonator for generating second harmonic beam. The Office Action also stated that a 3rd, 4th or 5th harmonic crystal 32 is located outside the resonator cavity and located along a preselected output paths of both output beams to produce a 3rd, 4th or 5th harmonic beam from the two output beams.

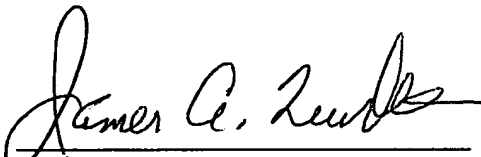
In any analysis of the Zhou laser of Fig. 7, it should be recognized that the laser described therein is inoperative. Output coupler 68 is set forth as antireflection coated for 1064 and highly reflective for 532. Since mirror 68 is antireflection coated for 1064, 1064 beam generated by laser material 20 would be absorbed and as a result, no lasing would occur on the cavity. Moreover, reflector 10 and second reflector 64 do not form a resonator as stated in the Office Action. The resonator in Fig. 7, if one is formed, is formed between 10 and 66. Not between 10 and 64. As a result, the 3rd harmonic crystal 32 is located within the resonator cavity. See column 7, lines 8 through 10 where it states that the 3rd harmonic is intra cavity generated. Thus, the laser of Fig. 7 does not show the generation of a harmonic beam outside the resonator cavity. To the contrary, it shows the generation of a third harmonic beam within the cavity. Thus, a number of the limitations required by claim 1 are not met by Zhao. The 3rd, 4th or 5th harmonic non linear crystal is not located outside the cavity in Zhou. The third harmonic beam is generated within the cavity. That is, between mirrors 10 and 66. Thus, the embodiment of Fig. 7 of Zhou is an intra cavity third harmonic generator. This is quite to the contrary to Applicant's invention where two beams having a different wave lengths at least one of which is a harmonic beam are removed from the cavity and in paragraph f) directed to

a third, fourth or fifth harmonic nonlinear crystal located outside the cavity to produce a third, fourth or fifth harmonic beam from the two output beams.

As a result, applicant submits the claimed invention is neither shown nor suggested by Zhou. Applicant gratefully acknowledge the Examiner's indication that claims 3 through 17 would be allowable if rewritten to overcome the § 112 rejection. Applicant has amended these claims to meet the § 112 rejections.

It is respectfully submitted that the application is in condition for allowance and an early notice to that effect is earnestly solicited.

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